

Appl. No. PCT/GB2003/003080

Amdt. dated Jan 16, 2005

Preliminary amendment on entry to national phase in the United States of America

Amendments to the Specification:

Please delete the paragraph beginning at page 7, line 26, which starts with “Preferably, the magnetic portions” and finishes at page 7, line 29, with “(samarium cobalt) magnets.”

Please replace the paragraph beginning at page 17, line 16 which starts with “In this embodiment” with the following amended paragraph:

In this embodiment the magnetic rings are annular rings and around 1.5mm thick and have an outer diameter of 27mm and a central aperture of diameter 15mm although it will be appreciated that a variety of sizes may be used. A further embodiment has a diameter of 28mm and a central aperture of 16mm for the female part 150. The magnetic rings 135, 165 are powerful enough to attract the parts 120, 150 of the connector 100 at a distance of up to 8cm. For stronger magnetic rings, the parts may attract each other at a distance of up to 12-20cm. However there is a balance between proximity of location and ease of separation for different embodiments – extremely strong magnetic rings that locate one another over 30cm apart would be increasingly difficult to separate when required. On the other hand, weak magnetic rings which are easier to separate would require the parts 120, 150 to be offered closer in order to seek and locate with each other and may not be powerful enough to maintain the weight of the male part 120 and attached bulb 101. therefore the direction of magnetism is through depth, ~~and the strength grade is preferably 30. The magnetic rings are preferably made from neodymium or samarium cobalt based rare earth materials, such as neodymium iron boron NdFeB known as ‘Neo’ or Samarium cobalt, SmCo5 or SM2Co17.~~ For other embodiments, for example, those used in industrial applications, the strength grade may be higher.

Please replace the paragraph beginning at page 18, line 14 which starts with “The Neo and samarium” with the following amended paragraph:

~~The Neo and samarium cobalt magnets have excellent qualities of high remanent magnetisation, high coercive force and high magnetic energy product and also the advantages of being easy to process and a relatively high performance/cost ratio. Neo and samarium cobalt magnets are especially suitable for this application because of their small volume, light weight and high quality.~~ The magnetic rings are available from Swift Levick Magnets Ltd, Barlborough UK; Goudsmit magnetics Limited of Surrey, United Kingdom or the Stanford Magnets Company of Aliso Viejo, California, USA.
Alternatively, magnetic discs instead of magnetic rings may be utilised.

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Please replace the paragraph beginning at page 23, line 15 which starts with “As well as ensuring” with the following amended paragraph:

As well as ensuring a concentric connection, the length of the wall 139 should be sufficiently large to provide a good mechanical connection and resist accidental disconnection. Moreover, the length of the wall 139 also affects the influence of the magnetic flux emitted by the magnet 135 – longer walls effectively increase the axial attraction relative to the transverse attraction. Shorter walls on the other hand effectively increase the transverse attraction relative to the axial attraction. ~~Indeed it has been found that more powerful magnets have a tighter flux and therefore require smaller walls than some weaker magnets which have a greater axial attraction.~~ A balance between axial and transverse attraction is required in order for the parts to self-seek and locate together without the need to be accurately aligned by the user. Therefore the separation is preferably larger than the minimum required to prevent off-set connection - around 1cm for preferred embodiments.

Please replace the paragraph beginning at page 31, line 1 which starts with “A significant advantage” with the following amended paragraph:

A significant advantage of certain embodiments of the invention, such as the third and fourth embodiments, is that [[the]] brittle rare-earth magnets are protected by shields making them less liable to chipping, breakage or other connection impact damage. Thus, the male 335 and female 365 magnets will never come into direct contact even when the parts 320, 350 have connected because they will remain spaced apart by the shield(s) 338. The shield(s) 338 may be made from, for example, any suitable plastic and are also preferably designed to absorb the high impact shock when the two parts engage with each other. Although providing shields 338 will reduce the magnetic attraction and strength of the connection between the magnets 335, 365 it has been found that this does not prevent the male and female parts, such as the parts 320, 350, seeking and locating with each other. Moreover, less metallic dust or debris will be attracted into the connector 300, 400 if the magnets are spaced away from the outer periphery of the parts 320, 350.